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EPE News

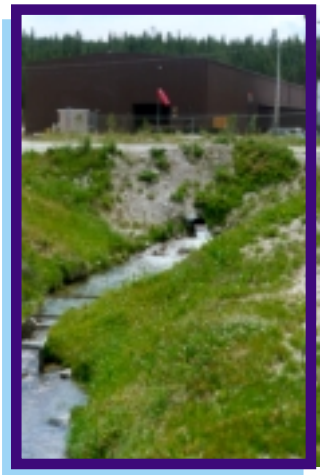
Energy & Process Engineering

# Leadville Wastewater Treatment

*Creating clean water....*


*The Bureau of Reclamation operates a water treatment facility to control mine drainage into the Arkansas River Basin.*

Heavy metal contamination of natural water sources continues to be a problem in the mining communities long after mining has ceased. Much effort and expense is necessary to remediate these problems, often with less than adequate results. Traditional methods (e.g., metal hydroxide precipitation) to remove heavy metals involve adding large quantities of chemicals to the waste stream which might contain quantities of contaminants at levels less than parts per thousand. Magnetic separation, a technology initially developed for other uses, is now being successfully applied to contaminated water streams. Its advantages are a smaller facilities footprint, less chemical additives required and consequently less sludge produced. Magnetic separation will even work on elements that are not intrinsically ferromagnetic or paramagnetic by the proper seeding of iron based compounds to the waste stream which act to scavenge the nonmagnetic contaminants. Methods have been developed that enable generation of magnetic particles (magnetite) in-situ at high temperatures (70°C). Our recent work has developed in-situ magnetite formation at lower temperatures (15°C). For this project, there were two distinct steps involved in developing our approach; one was to achieve the appropriate water chemistry to form the magnetite seeds to which the contaminants bind them-selves and the other was to develop the physical magnetic separation process using remnant fields. This work will provide an



*Current discharge averages 1800 gpm annually.*

*Traditional Floc flotation technology results in a relatively large footprint and large chemical inventories for the facility.*

*Leadville continued on page 2*

*Leadville — continued from page 1.*

*The tunnel drains an extensive network of mines in the Leadville area.*

avenue for treatment of a great many heavy metal contamination sites.

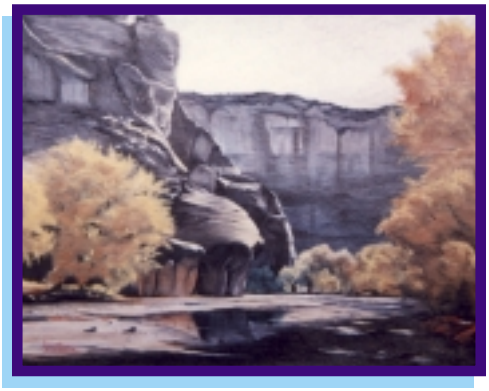
These two tasks were conducted at New Mexico State University (wet chemistry) and at Los Alamos National Laboratory (remnant magnetic field work). After a successful process has been established, it is anticipated that a small portable treatment pilot plant will be constructed and tested at the Leadville site.

*The facility is state-of-the-art but discharge requirements are expected to become more stringent.*

# Len Stapf

## *A Man of Many Hidden Talents*

Len Stapf has been intrigued with art and music as long as he can remember. As a young child growing up in California, he spent many hours drawing and painting with colored pencils, paints, and charcoal. In the mid 1950s Len earned his pocket money by hand painting pin-striping and flames on cars. He continued his artwork through high school and earned a scholarship to the Chanard Art Institute in southern California. After one semester though, Len decided to move on to bigger and better things.



*Canyon de Chelley. Oil on canvas.*

In 1962 Len interviewed with HyCon, a company in southern California that was looking for technical illustrators and draftsmen. He took the job as a technical draftsman which paid $1.00 more per hour than the illustrator position. By day, Len worked on technical drawings, but by night, he fed his artistic side by playing in a rock band on the southern California nightclub circuit. Though Len never had any formal music training he is self-taught and proficient on piano, organ, and guitar. Len worked at HyCon for three years and then went on to work in various other technical illustration and draftsman positions before moving to Scottsdale, Arizona in December of 1976.

Len took a job as a mechanical designer with Motorola in Arizona working in the Government Electronics Division. Since his family was still in California his nights were free so Len got back into oil painting and joined a music group to fill the time.

In 1977, Len moved to Los Alamos to take a job as a Tech 4 senior designer at what was

*Seascape. Oil on canvas.*

*F-105, Fighting Falcon. Oil on canvas.*

then E-2. He later became Section Leader for E-2. During this time he rekindled his love for painting after visiting an art show at the San Ildefonso Pueblo. Many of his paintings from this time period were in expositions at Mesa Public Library and at Los Alamos National Bank.

Being an innovator and entrepreneur, in 1980 Len quit his job at the Lab and started a business called Qualitronics with a friend. Qualitronics specialized in the design and fabrication of

*Spider Rock in Canyon de Chelley, NM. Oil on canvas.*

circuit boards and chassis electronics. Unfortunately, the new business was to be based in Dallas, TX and Len didn't want to move his family to Dallas so in 1981 he returned to the Lab to work with AP1 as a Senior Designer here at TA-46. And he's been here ever since.

Work and raising a family made it difficult to continue his artwork on a regular basis, but now that the family has grown, Len is getting back into painting and looking into taking his artwork to a new level. Len specializes in oil paintings of landscapes, seascapes, Westerns, and aircraft but he hopes to get back into automotive artwork as well, painting pin-striping and flaming on cars. Len also hopes to some day have his paintings shown in galleries and juried shows.

## Safety for you . . .

**DANGER** **SPRING YARD WORK AHEAD**

Temperatures are rising, sunshine abounds, and the flowers and the trees are beginning to bud. It's the time of year that many of us begin to venture outdoors to take on the yard and various other home improvement projects. While many of us look forward to working in the garden and around the house, more than 400,000 injuries occur each year as a result of mishaps related to lawn mowers, electric tools, and ladders.

While spring cleaning projects can be fun for the whole family, there are simple precautions that should be taken before using lawn and garden equipment, power tools, and ladders.

### Ladders

- Always use a ladder that is long enough for the job at hand. Many ladder mishaps are due to using a ladder that is just too short.
- Do not carry equipment while climbing a ladder. Invest in a tool belt, or have someone hand the equipment up to you.
- Face the ladder while climbing up or down; keep your body centered between both side rails.
- While up on the ladder, do not overextend your reach. Make sure you keep your weight evenly distributed.

### Lawn and Garden Tools

- When using garden appliances and power tools, always wear proper attire. Keep clothing, hands, and feet away from cutting blades at all times. Never wear jewelry when working with tools. Always wear safety glasses.
- Pay attention to warning markings. Don't allow tools to get wet unless they're labeled "immersible." When using tools or extension cords outside, make sure they are appropriate for outdoor use.
- Never alter a product or remove safety features, such as blade guards or electric grounding pins.
- Check the switch on a power tool or garden appliance to make sure it's in the "OFF" position before you plug it in.

### Lawn Mowers

- Always start the mower outdoors. Never operate the mower where carbon monoxide can collect, such as a closed garage, storage shed, or basement.
- If you have a gasoline-fueled mower, store gas in a UL Listed safety can. Fill the mower outside, using a funnel to prevent spills. Stay away from possible ignition sources and replace the gas cap firmly when done.
- Electrically powered mowers should not be used on wet grass. Use an extension cord designed for outdoor use and rated for the power needs of your mower.
- Make sure all safety guards are in place and keep the mower's blades sharp. If you hit a foreign object or have a mower malfunction, remember to turn off the mower and disconnect the power cord before inspecting for damage.

# Security Begins with You

When it comes to security questions, it's better to ask than to guess and end up in a lot of trouble you didn't bargain for. Here is a useful list of the Division's Security Contacts:

**OSSO**
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**March 2001**

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**April 2001**

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| March 6 | Group Meeting at MSL Auditorium |
| April 2-6 | Spring Break for K-12 |
| April 3 | Group Meeting at MSL Auditorium |

*Chimayo Cowboy. Oil on canvas by Len Stapf.*

**Los Alamos** NATIONAL LABORATORY

**ESA-EPE Group Office:** Paul Wantuck, Group Leader; Gary Read, Deputy Group Leader; Margaret White, Group Office Administrator; Lisa Lindberg, Writer/Editor.

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